

# Rules of Department of Economic Development

## Division 240—Public Service Commission Chapter 124—Manufactured Home Tie-Down Systems

Title	Page
<b>4 CSR 240-124.010</b> Definitions.....	3
<b>4 CSR 240-124.020</b> Administration and Enforcement .....	3
<b>4 CSR 240-124.030</b> Determination of Applicable Manufactured Home Systems Standards .....	3
<b>4 CSR 240-124.040</b> Commission Approval of Manufactured Home Tie-Down Systems .....	3
<b>4 CSR 240-124.045</b> Anchoring Standards .....	4
<b>4 CSR 240-124.050</b> Standards.....	12
<b>4 CSR 240-124.060</b> Complaints.....	12

**Title 4—DEPARTMENT OF  
ECONOMIC DEVELOPMENT  
Division 240—Public Service Commission  
Chapter 124—Manufactured Home  
Tie-Down Systems**

**4 CSR 240-124.010 Definitions**

*PURPOSE: This rule defines the terms used in this chapter.*

(1) The following definitions, as well as those set out in section 700.010, RSMo 2000 apply to this chapter:

(A) Approval means a written approval of a manufactured home tie-down system issued by the commission under section 700.080, RSMo 2000;

(B) Director means the director of the Manufactured Housing and Modular Units Program of the Public Service Commission and those working under his/her supervision;

(C) Manufactured home as defined by section 700.010, RSMo 2000 shall include units which are in two (2) or more separately towable components designed to be joined into one (1) integral unit capable of being again separated into the components and also includes two (2) manufactured home units joined into a single residential or business unit which are kept on a separate chassis for repeated towing. Manufactured home shall not include a recreational vehicle;

(D) Standards means the manufactured home tie-down systems standards adopted by the commission under section 700.076, RSMo 2000; and

(E) Authorized representative means the approved testing agency who certified the tie-down system test.

*AUTHORITY: section 700.076, RSMo 2000.\* Original rule filed Nov. 12, 1976, effective Feb. 11, 1977. Emergency rule filed Dec. 7, 1976, effective Dec. 17, 1976, expired April 16, 1977. Amended: Filed Oct. 12, 1982, effective Jan. 13, 1983. Amended: Filed June 12, 2001, effective Jan. 30, 2002.*

*\*Original authority: 700.076, RSMo 1976, amended 1978, 1982.*

**4 CSR 240-124.020 Administration and Enforcement**

*PURPOSE: This rule delegates the responsibility for administering and enforcing this chapter and Chapter 700, RSMo (1986) as it relates to manufactured home tiedown systems.*

(1) The commission's powers and responsibilities under Chapter 700, RSMo (1986)

with respect to manufactured home tiedown systems are delegated to the director.

*AUTHORITY: section 700.076, RSMo 1986.\* Original rule filed Nov. 12, 1976, effective Feb. 11, 1977. Emergency rule filed Dec. 7, 1976, effective Dec. 17, 1976, expired April 16, 1977. Amended: Filed Oct. 12, 1982, effective Jan. 13, 1983.*

*\*Original authority: 700.076, RSMo 1976, amended 1978, 1982.*

**4 CSR 240-124.030 Determination of Applicable Manufactured Home Systems Standards**

*PURPOSE: This rule describes how to determine which standards apply to a particular manufactured home.*

(1) All manufactured homes located in this state, subject to the exceptions set out in sections 700.076 and 700.085, RSMo (1986) shall be tied down in accordance with applicable standards.

(2) A manufactured home located in this state which entered the first stage of production before November 23, 1976 shall be tied down in accordance with the standards in effect on November 23, 1976.

(3) A manufactured home located in this state which entered the first stage of production after November 22, 1976 shall be tied down in accordance with the standards in effect at the time it entered the first stage of production.

*AUTHORITY: section 700.076, RSMo 1986.\* Original rule filed Nov. 12, 1976, effective Feb. 11, 1977. Emergency rule filed Dec. 7, 1976, effective Dec. 17, 1976, expired April 16, 1977. Amended: Filed Oct. 12, 1982, effective Jan. 13, 1983.*

*\*Original authority: 700.076, RSMo 1976, amended 1978, 1982.*

**4 CSR 240-124.040 Commission Approval of Manufactured Home Tie-Down Systems**

*PURPOSE: This rule describes the manner in which an approval of manufactured home tie-down systems may be obtained.*

(1) No person may sell, offer for sale or as a business install or cause to be installed a manufactured home tie-down system unless the system has been approved in writing by the director and the original or duplicate orig-

inal of such approval is prominently displayed at the location where the system is sold, offered for sale or offered for installation.

(2) Applications for an approval shall be submitted to the director and shall be executed by the owner or seller of the system on forms that shall be provided by the director upon request. To be complete, the applications shall include:

(A) The name and address of the applicant;

(B) The name and address of all places of business which will be authorized by the applicant to sell or offer for sale, or install or offer to install the system for which the approval is sought;

(C) If the applicant is a corporation, a copy of the applicant's articles of incorporation, bylaws and most recent annual registration filed under section 351.120, RSMo (1986), along with a copy of documents which verify that the officer who has executed the application has actual authority to have done so;

(D) The name and address of the manufacturer of the system for which the approval is sought;

(E) A copy of the plans and specifications of the system for which the approval is sought.

1. Detailed drawings and installation instructions of each type of anchor system and for each type of component for which approval is sought must accompany the submittal.

A. Each drawing shall show model identification, all dimensions, types of welds or fastening, types of material, methods of securing strap, methods of attachment, orientation after installation in soil, direction(s) of applied load(s), and location of model number on the system and each component.

B. Each drawing shall bear the seal of a registered professional engineer, registered in the state of Missouri.

2. Each anchor system model must be tested and certified by a recognized testing agency to be in conformance with the standards promulgated by the commission and accepted engineering practice.

A. Pullout tests shall be performed on three (3) samples of each anchor system model and the failure load for all three (3) tests must equal or exceed four thousand seven hundred twenty-five (4,725) pounds. An authorized representative of the commission must certify that three (3) pullout tests were performed on each anchor system model. The anchor shall be installed with the specified tie attached, in a soil type for which the anchor is designed and pulled at an angle between forty degrees (40°) and fifty degrees (50°). The anchor will be approved for all

soil test probe values at or above the soil test probe value in which the anchor is tested. The device shall be set up as required by the installation instructions. The test report shall include a photograph or drawing. The load at failure and the type of failure shall be described. The anchoring system must be capable of meeting or exceeding the Zone 1 wind load requirements of the Federal Manufactured Home Construction and Safety Standards 24 CFR 3280.306.

B. Failure and ultimate load capacity tests shall be performed on three (3) samples of each component part and must also be witnessed by an authorized representative of the commission.

C. Laboratory destruction tests shall be performed on each anchor system model and the failure load must equal or exceed four thousand seven hundred twenty-five (4,725) pounds. These tests are needed to establish the required strengths of the components and component connections of an anchor.

3. The result from each test will indicate:

- A. Point and mode of failure;
- B. Force required for failure;
- C. Description of test procedure;
- D. Test equipment used.

4. The report of the results of the test in specified soil or rock groups will also include:

- A. Method of installation;
- B. Date of installation;
- C. Date of test;
- D. Soil profile description and soil test probe values.

5. The anchor manufacturer shall furnish and ship with each anchoring system, information on the types of soil in which the anchor has been tested and certified for installation, instructions on the method of installation, and procedure for identifying soil types. A copy of the installation instructions must be filed with the director.

6. The director, upon receipt of new or additional information relating to the performance of any anchoring system, or a similar anchoring system, may request from the manufacturer of that anchoring system, additional testing or supplemental information.

7. Rock anchors shall be tested in specified rock. Rock anchors shall be field-tested in natural rock strata or in a rock sample. There must be twelve-inch (12") minimum radius of rock around the drilled hole. The natural rock strata or rock sample must be geologically described;

(F) The location in this state where the system for which the approval is sought may be inspected by the director; and

(G) An affidavit of the applicant or the applicant's authorized representative if the applicant is a corporation, that the system for which the approval is sought will be manufactured in accordance with the plans and specifications submitted with the application and that as such it complies with the standards.

(3) Within eight (8) working days after a complete application for an approval has been received by the director, the director shall inspect for compliance with the standards the manufactured home tie-down system for which the approval is sought. If through no fault of the applicant such inspection is not conducted within the prescribed time, the approval shall be issued if no basis for refusal is found on the face of the application.

(4) An approval or a refusal to grant an approval shall be issued in writing by the director within ten (10) working days after s/he has received a complete application for an approval. A notice of a refusal to grant an approval shall specify the reason for the refusal.

(5) No person, without the director's authorization, may copy or otherwise duplicate an approval unless the word copy appears in at least thirty-six (36)-point type down the left and right margins of such approval.

(6) Every person who purchases a manufactured home tie-down system shall be furnished by the seller with a copy of the approval for the system purchased.

(7) The commission shall issue an original approval for each place of business at which an applicant or his/her authorized agent sells, offers for sale or offers to install an approved manufactured home tie-down system.

*AUTHORITY: section 700.076, RSMo 2000.\* Original rule filed Nov. 12, 1976, effective Feb. 11, 1977. Emergency rule filed Dec. 7, 1976, effective Dec. 17, 1976, expired April 16, 1977. Amended: Filed Oct. 12, 1982, effective Jan. 13, 1983. Amended: Filed June 12, 2001, effective Jan. 30, 2002.*

*\*Original authority: 700.076, RSMo 1976, amended 1978, 1982.*

#### **4 CSR 240-124.045 Anchoring Standards**

*PURPOSE: This rule applies to the anchoring of any manufactured home purchased or relocated on or after the effective date of this rule. This rule shall not be applicable to any*

*manufactured home which has previously been anchored at its existing location and which has not been relocated subsequent to the effective date of this rule.*

(1) Definitions. The following definitions, as well as those set out in section 700.010, RSMo apply to this chapter:

(A) Anchor means any device designed to transfer wind loads imposed on a manufactured home to the ground;

(B) Anchoring equipment means straps, seals, cables, turnbuckles, and tensioning devices, which are used to secure a manufactured home to anchors;

(C) Anchoring systems means a combination of ties, anchoring equipment, and anchors that will, when properly designed and installed, resist overturning and lateral movement of the manufactured home from wind forces;

(D) Classified soil means soil that has been evaluated through the use of a standard soil torque probe or other approved method to determine anchor-holding capacity;

(E) Installed means the arrangement and assembly at the occupancy site of all portions of an anchoring system, in accordance with the manufacturer's design, that renders the anchoring system fit for its intended use;

(F) Stabilizing device means a lateral support device such as a steel plate or a concrete collar used in connection with an anchor to limit lateral movement of the anchor;

(G) Tie means straps, cable, or securing devices used to connect the manufactured home to the anchor; and

(H) Unclassified soil means soils that have not been evaluated to determine anchor-holding capacity.

(2) Anchoring System. Each manufactured home installed after the effective date of the rule must be anchored in accordance with the minimum standards specified in the rule. At a minimum, each anchoring system must also meet or exceed the design wind load requirements for Wind Zone 1, as defined in 3280.305 in the Federal Manufactured Home Construction and Safety Standards.

(3) Anchoring Equipment.

(A) Load. Anchoring equipment, when installed, must be capable of resisting an allowable working load equal to or exceeding three thousand one hundred fifty (3,150) pounds and must be capable of withstanding a fifty percent (50%) overload (four thousand seven hundred twenty-five (4,725) pounds total) without failure of either the anchoring equipment or the attachment point on the manufactured home.

(B) Resistance to Weather Deterioration. Anchoring equipment exposed to weathering shall have a coating that is resistant to weather deterioration at least equivalent to that provided by a coating of zinc on steel of not less than 0.30 ounces per square foot of surface (.0005 inch in thickness), and in accordance with the following:

1. Slit or cut edges of zinc-coated steel strapping do not need to be zinc coated;

2. Flat steel strapping shall be Type 1, Heavy Duty, Finish B, Grade 1, 1 1/4 inches wide and 0.035 inch in thickness, certified by a registered professional engineer as conforming with ASTM Standard Specification D3953-91, Standard Specification for strapping, flat steel, and seals; and

3. Seals shall be Class H, Heavy Duty, Finish B, Grade 1, for steel strapping, certified by the manufacturer as conforming with ASTM Standard Specification D3953-91.

(C) Permanency of Connections. Anchoring equipment shall be designed and installed to prevent self-disconnection when ties are slack.

(4) Tensioning Devices. Tensioning devices such as turnbuckles or yoke-type fasteners shall be ended with clevis or forged or welded eyes.

(5) Ties.

(A) Material.

1. Flat steel strapping and seals or other approved methods or materials shall be used for ties. All ties shall be fastened to anchors and drawn tight with turnbuckles or other adjustable tensioning devices or devices approved for use with the anchor.

2. Tie materials shall be either as described in (3)(B)2. of this standard or other approved material capable of resisting an allowable working load of three thousand one hundred fifty (3,150) pounds with no more than twelve percent (12%) elongation and shall withstand a fifty percent (50%) overload (four thousand seven hundred twenty-five (4,725) pounds total).

(B) Attachment.

1. Ties shall connect the anchor and the main structural steel frame that runs lengthwise under the manufactured home. Ties shall not connect to steel outrigger or cross beams that fasten to and intersect the main structural frame. Tie-down straps shall be routed from the anchor to the top of the main structural steel frame.

2. Tie-down straps shall be attached to the anchor in accordance with the anchor manufacturer's instructions. A permanently attached strap that has been cut off may be

spliced, provided an approved splicing device is used.

(C) Vertical Ties. Vertical ties are not required in Wind Zone 1, as defined in 3280.305 in the Federal Manufactured Home Construction and Safety Standards.

(6) Anchors.

(A) Each anchor, when installed in classified soil, must be capable of resisting a minimum allowable working load of three thousand one hundred fifty (3,150) pounds in the direction of the tie, plus a fifty percent (50%) overload (four thousand seven hundred twenty-five (4,725) pounds total) without failure. Failure shall be considered to have occurred when the head of the anchor moves more than two inches (2") vertically or three inches horizontally when pulled at an angle of between forty degrees (40°) and fifty degrees (50°) under a force of four thousand seven hundred twenty-five (4,725) pounds.

(B) Each manufactured anchor shall be tested and installed in accordance with the terms of its specified testing procedures and the anchor manufacturer's instructions. Each anchor shall be installed and pre-tensioned until it is flush with the stabilizer plate. The slotted bolt must have a minimum of four (4) wraps of the strap after installation.

(C) Spacing and Location.

1. Classified soil.

A. All anchors shall be installed at the intervals and in the locations specified by the manufactured home manufacturer's installation instructions, and in the correct soil class for which they are approved.

B. In the event that the manufacturer's installation instructions are unavailable, all anchors shall be installed in accordance with Tables (A) through (C) of this standard included herein, and in the correct soil class for which they are approved.

2. Unclassified soil. All anchors installed in unclassified soil shall be in accordance with Tables (A) through (C) of this standard, included herein. A thirty-inch (30") double four-inch (4") helix anchor with a twelve-inch (12") stabilizer shall be used in unclassified soil.

3. Spacing.

A. Spacing shall be as even as practicable along the entire length of the home with the first anchor on each end no more than two feet (2') from the end of the home.

(D) Soil Testing. A determination for soil classification should be made at each anchor location through the use of a standard torque probe, as described in ASTM Standard D2573-94, or equivalent method. If no soil classification test is performed for the anchor

location, then the soil at the location shall be considered as unclassified.

(7) Diagonal Tie-Down Strap Spacing. Strap spacing for anchors is illustrated in the following tables.

(A) Tables (A) through (C), included herein, illustrate the strap spacing for single section and multi-section homes with anchors located in classified and unclassified soils.

1. Note that the maximum vertical distance is measured from the anchor head to the top of the I-beam (i.e., bottom of the floor).

2. The maximum distance to the first tie-down strap at each end of the home shall be two feet (2'0").

3. Strap spacing calculations are based on the fact that single disk anchors and double disk anchors have the same holding capacity if installed in accordance with the anchor manufacturer's installation instructions and in the proper soil classification.

4. Anchors shall be installed just inside the skirting line in order to maintain the angles identified in each table.

5. Anchor strap attachments to the home must be in accordance with the anchor manufacturer's methods.

(B) Tables (D) and (E), included herein, illustrate the criss-cross strapping system for elevated single and multi-section homes (or portion thereof) to be used in lieu of diagonal tie-down strap spacing tables; and

(C) Table (F), included herein, illustrates approved methods of ground anchor installation.

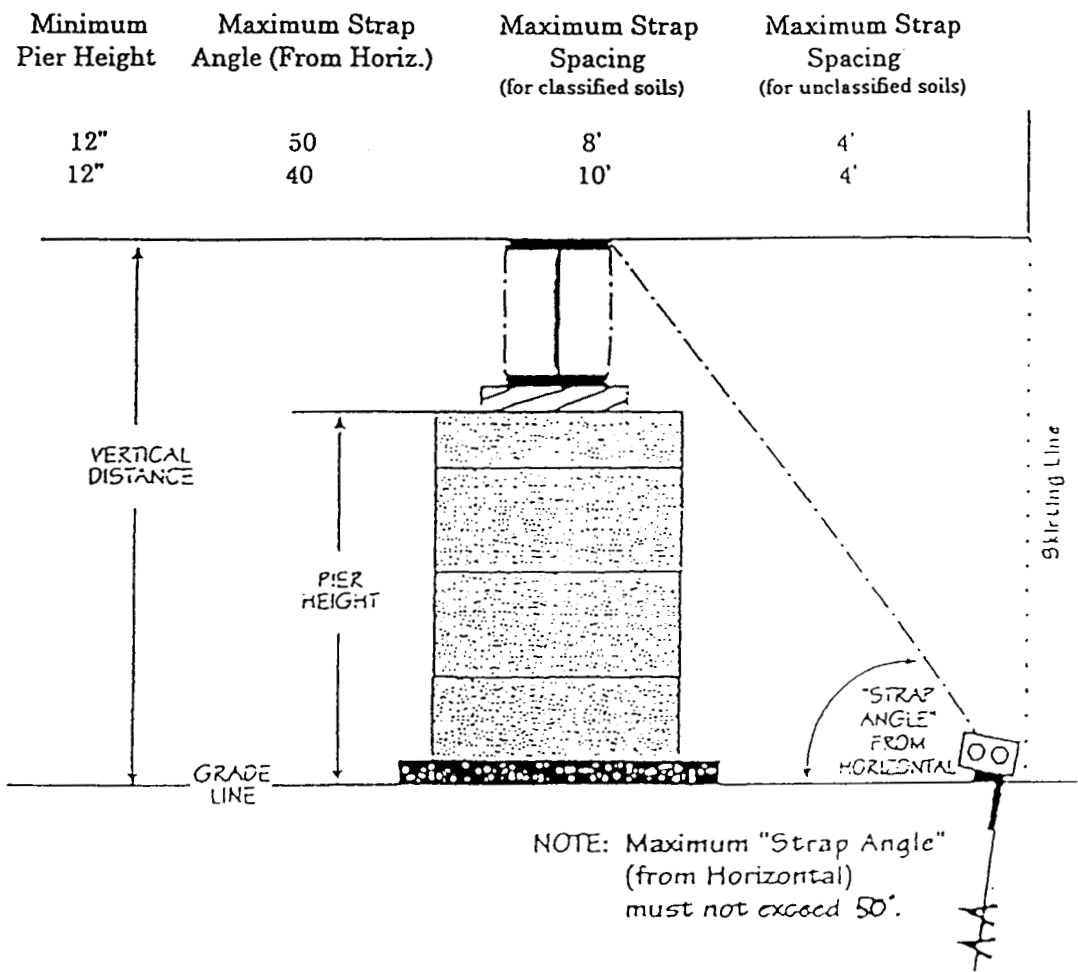
(8) Spacing For Federal Manufactured Home Construction and Safety Standards Wind Zone 1 Conditions.

(A) If the floor width is one hundred sixty-six inches (166") (typical fourteen (14)-wide), with I-beam spacing ninety-five inches (95") or greater center to center and the distance from the top of the footer to the top of the I-beam is no higher than sixty-four inches (64"), anchors shall be spaced eight feet (8') apart for classified soil, or five feet (5') apart for unclassified soil.

(B) If the floor width is one hundred forty-one inches (141") (typical twelve (12)-wide), with I-beam spacing seventy-five and one-half inches (75.5") or greater center to center and the distance from the top of the footer to the top of the I-beam is no higher than fifty-two inches (52"), anchors shall be spaced six feet (6') apart for classified soil, or four feet (4') apart for unclassified soil.

(C) Anchors must be installed just inside the skirting line, or as close to the skirting line as possible.

**TABLE (A)**  
**DIAGONAL TIE DOWN STRAP SPACING**  
**FOR SINGLE SECTION AND MULTI-SECTION HOMES**  
**TYPICAL 12' WIDE**



- Classified soil is soil that has been evaluated through the use of a standard torque probe, or other approved method to determine anchor-holding capacity. Each anchor location must be probed to confirm ground anchor models to be installed are consistent with soil classification.
- Unclassified soil is soil that has not been evaluated to determine anchor-holding capacity. At a minimum, a 30" double 4" helix anchor with a 12" stabilizing plate shall be used in unclassified soils.
- Anchors must be installed just inside the skirting line or as close to the skirting line as possible.

**TABLE (B)**  
**DIAGONAL TIE DOWN STRAP SPACING**  
**FOR SINGLE SECTION AND MULTI-SECTION HOMES**  
**TYPICAL 14' WIDE**

Minimum Pier Height	Maximum Strap Angle (From Horiz.)	Maximum Strap Spacing (for classified soils)	Maximum Strap Spacing (for unclassified soils)
12"	50	10'	4'
12"	40	12'	4'

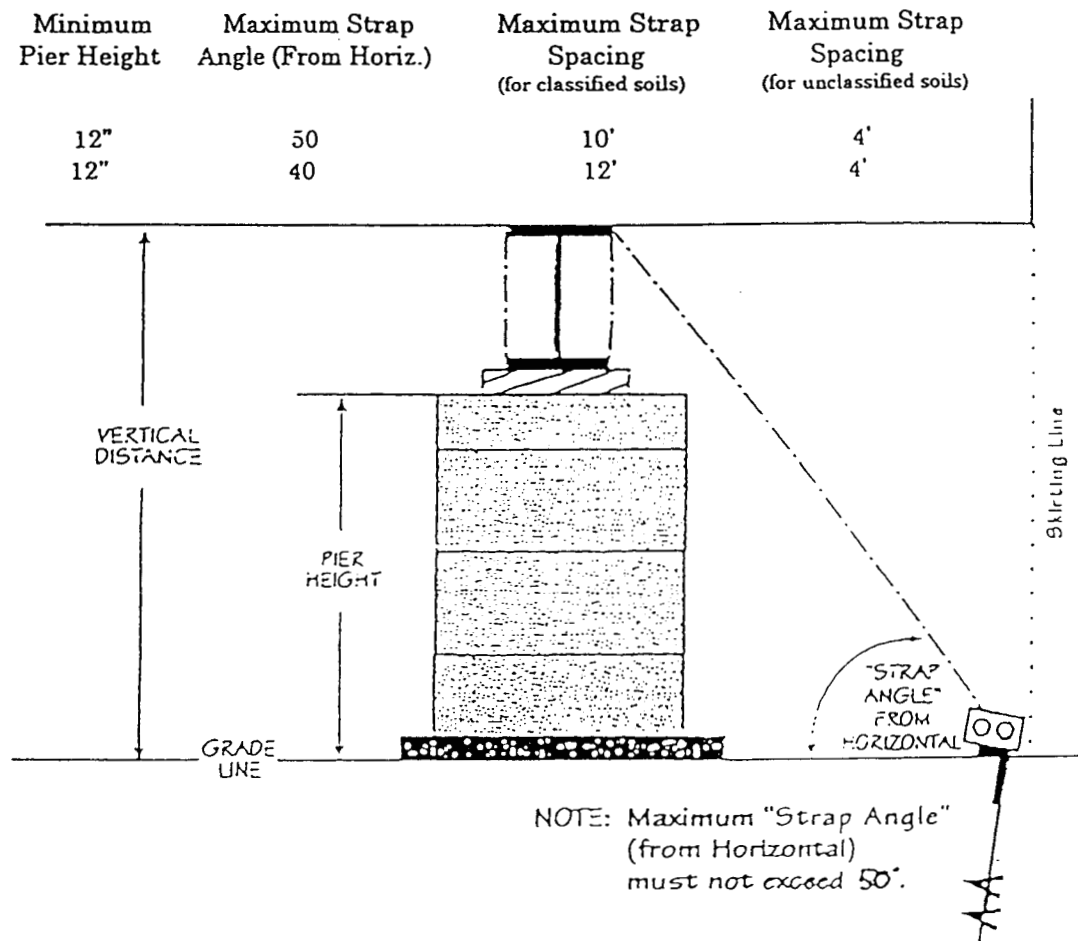
  

The diagram illustrates a cross-section of a manufactured home foundation. A concrete pier is shown with a horizontal strap attached to its top. The strap extends diagonally down to an anchor point located just inside a vertical 'Skirting Line'. Key dimensions and labels include: 'VERTICAL DISTANCE' from the ground to the top of the pier; 'PIER HEIGHT' from the ground to the top of the pier; 'GRADE LINE' at the base of the pier; 'STRAP ANGLE FROM HORIZONTAL' indicated by an arc at the anchor point; and 'Skirting Line' shown as a vertical dashed line. A note specifies that the maximum strap angle must not exceed 50 degrees.

NOTE: Maximum "Strap Angle"  
 (from Horizontal)  
 must not exceed 50°.

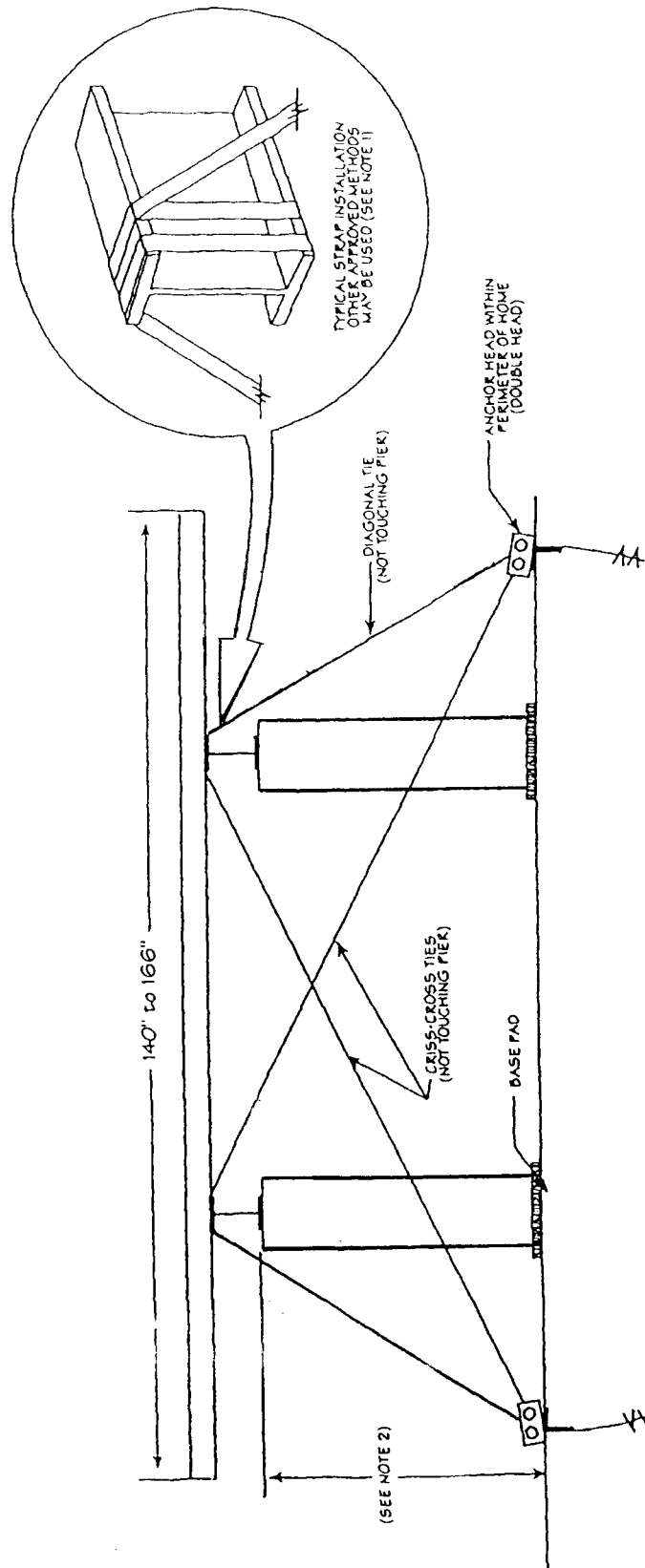
- Classified soil is soil that has been evaluated through the use of a standard torque probe, or other approved method to determine anchor-holding capacity. Each anchor location must be probed to confirm ground anchor models to be installed are consistent with soil classification.
- Unclassified soil is soil that has not been evaluated to determine anchor-holding capacity. At a minimum, a 30" double 4" helix anchor with a 12" stabilizing plate shall be used in unclassified soils.
- Anchors must be installed just inside the skirting line or as close to the skirting line as possible.

**TABLE (C)**  
**DIAGONAL TIE DOWN STRAP SPACING**  
**FOR SINGLE SECTION AND MULTI-SECTION HOMES**  
**TYPICAL 16' WIDE**



- Classified soil is soil that has been evaluated through the use of a standard torque probe, or other approved method to determine anchor-holding capacity. Each anchor location must be probed to confirm ground anchor models to be installed are consistent with soil classification.
- Unclassified soil is soil that has not been evaluated to determine anchor-holding capacity. At a minimum, a 30" double 4" helix anchor with a 12" stabilizing plate shall be used in unclassified soils.
- Anchors must be installed just inside the skirting line or as close to the skirting line as possible.

TABLE (D)  
ALTERNATIVE STRAPING SYSTEM FOR SINGLE SECTION HOMES  
For use in lieu of diagonal tie down strap spacing in circumstances  
where 40 degree to 50 degree strap angle cannot be achieved

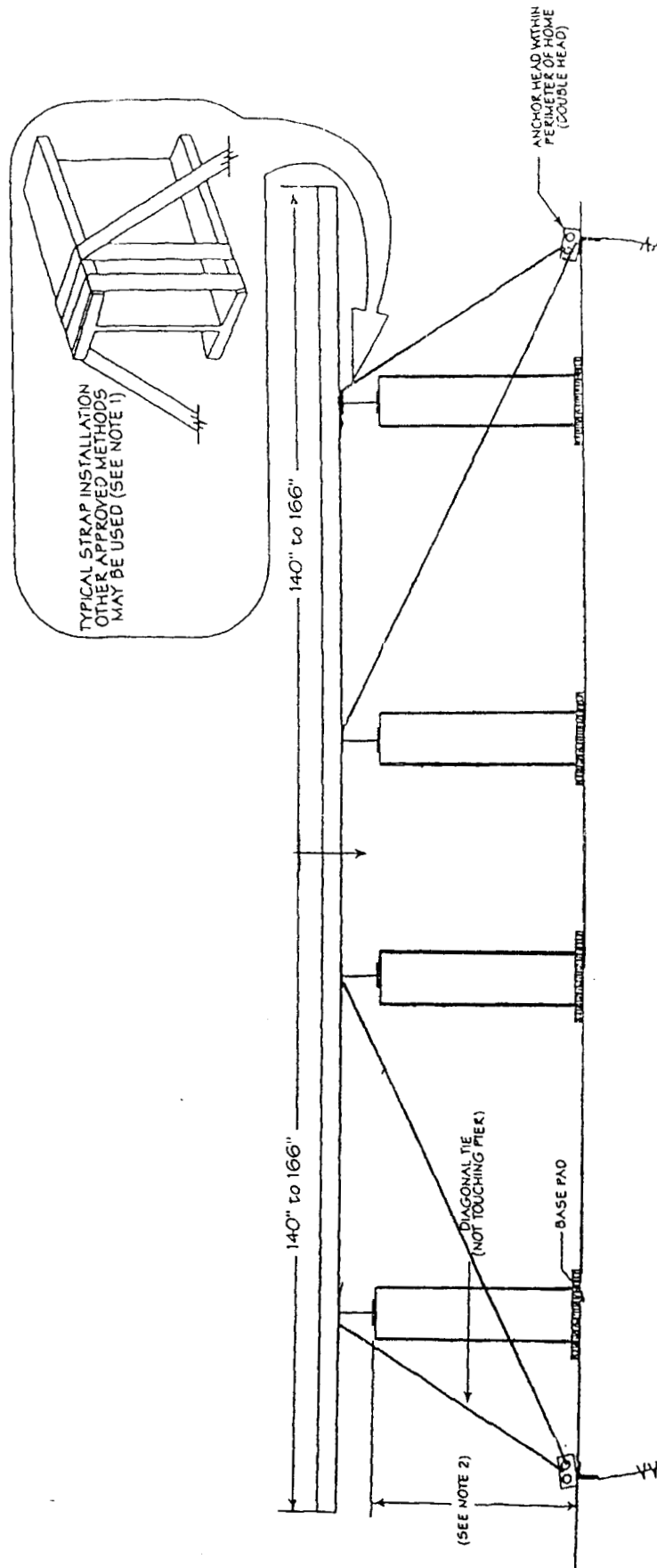


## NOTES:

1. Inset drawing shows typical strap installation. All anchors, devices, and tiedown straps to be rated for a 3150 lbs. working load (4725 lbs. overload capacity), in classified soils.
2. Pier height is measured from the top of the ground to the top of the I-Beam. Pier heights exceeding 80" must have piers and tiedowns designed by a Professional Engineer. Minimum pier height is 12"



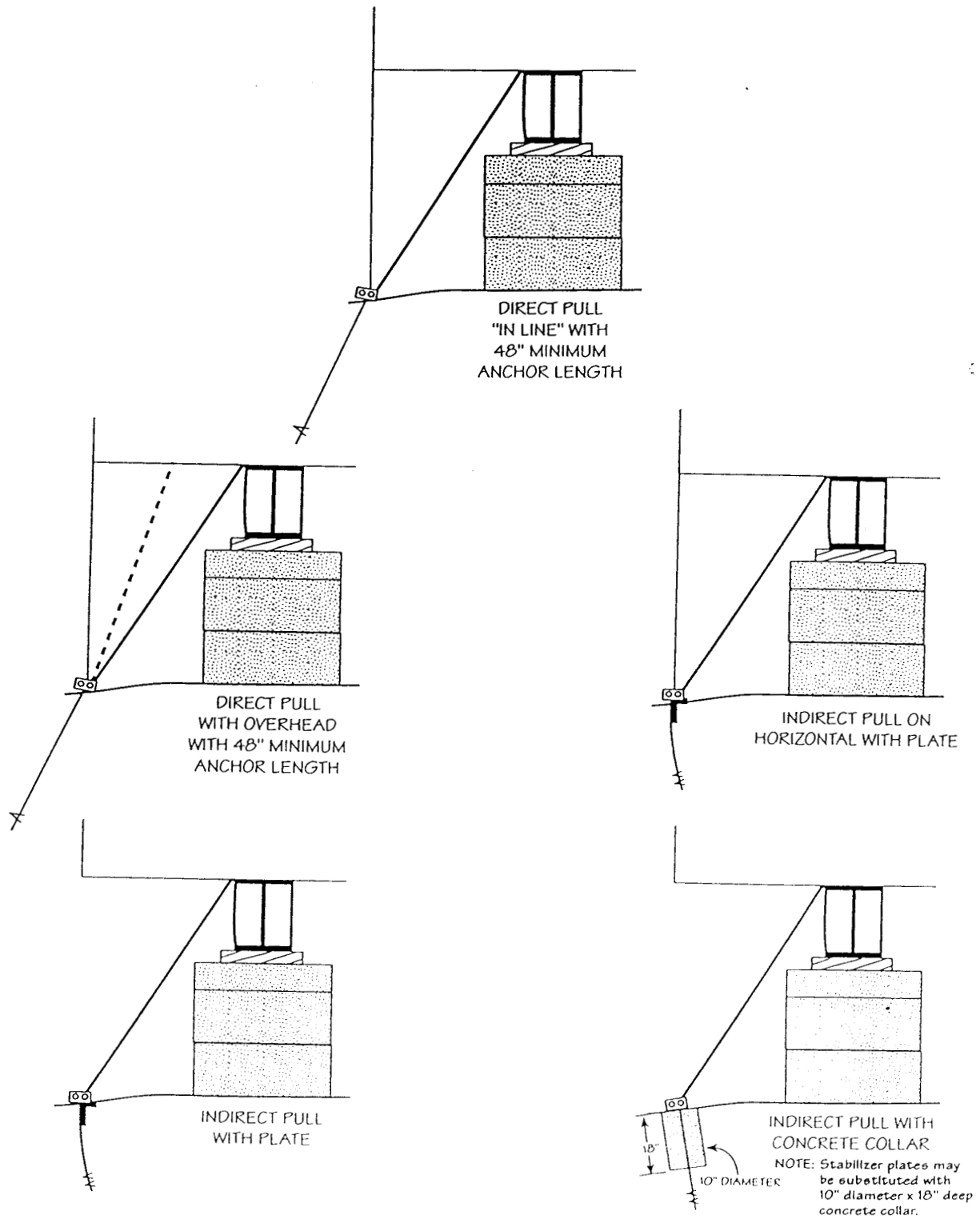
**TABLE (E)**  
**ALTERNATIVE STRAPING SYSTEM FOR MULTI-SECTION HOMES**  
 For use in lieu of diagonal tie down strap spacing in circumstances  
 where 40 degree to 50 degree strap angle cannot be achieved



**NOTES:**

1. Inset drawing shows typical strap installation. All anchors, devices, and tiedown straps to be rated for a 3150 lbs. working load (4725 lbs. overload capacity), in classified soils.
2. Pier height is measured from the top of the ground to the top of the I-Beam. Pier heights exceeding 80" must have piers and tiedowns designed by a Professional Engineer. Minimum pier height is 12".

TABLE (F)  
APPROVED METHODS OF GROUND  
ANCHOR INSTALLATION





*AUTHORITY: section 700.076, RSMo 2000\*. Original rule filed June 12, 2001, effective Jan. 30, 2002.*

*\*Original authority: 700.076, RSMo 1976, amended 1978, 1982.*

#### 4 CSR 240-124.050 Standards

*PURPOSE: This rule establishes the manufactured home tiedown systems standards for manufactured homes located in this state which entered the first stage of production after November 22, 1976.*

*PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. Therefore, the material which is so incorporated is on file with the agency who filed this rule, and with the Office of the Secretary of State. Any interested person may view this material at either agency's headquarters or the same will be made available at the Office of the Secretary of State at a cost not to exceed actual cost of copy reproduction. The entire text of the rule is printed here. This note refers only to the incorporated by reference material.*

(1) The federal standards set out at 24 CFR section 280.306 constitute the manufactured home tiedown systems standards for manufactured homes located in this state which entered the first stage of production after November 22, 1976.

*AUTHORITY: section 700.076, RSMo 1986.\* Original rule filed Nov. 12, 1976, effective Feb. 11, 1977. Emergency rule filed Dec. 7, 1976, effective Dec. 17, 1976, expired April 16, 1977. Amended: Filed Oct. 12, 1982, effective Jan. 13, 1983.*

*\*Original authority: 700.076, RSMo 1976, amended 1978, 1982.*

#### 4 CSR 240-124.060 Complaints

*PURPOSE: This rule provides for the manner in which complaints may be filed and the procedure by which commission review of the decisions, directives and interpretations of the director may be obtained.*

(1) Any person aggrieved by a violation of this chapter or Chapter 700, RSMo (1986) as it relates to manufactured home tiedown sys-

tems may file a formal or informal complaint under 4 CSR 240-2.070.

(2) Commission review of the decisions, directives and interpretations of the director which relate to the standards, this chapter or Chapter 700, RSMo (1986) as it relates to manufactured home tiedown systems may be obtained by filing a written formal or informal complaint under 4 CSR 240-2.070. In such a complaint, the director shall be denominated as the respondent.

*AUTHORITY: section 700.076, RSMo 1986.\* Original rule filed Nov. 12, 1976, effective Feb. 11, 1977. Emergency rule filed Dec. 7, 1976, effective Dec. 17, 1976, expired April 16, 1977. Amended: Filed Oct. 12, 1982, effective Jan. 13, 1983.*

*\*Original authority: 700.076, RSMo 1976, amended 1978, 1982.*